

Claims

1. A worm gear for a vehicle steering system comprising a shaft (5) mounted so as to be able to swivel in the radial direction (23), a worm (17) disposed in a rotationally fixedly manner on said shaft (5), and a worm wheel (19) meshing with said worm (17), said worm (17) and said worm wheel (19) being preloaded in the radial direction, characterized in that the pressure angle α_r of the right tooth flank (20) and the pressure angle α_l of the left tooth flank (22) are different from each other and are so selected that the normal force (F_N) between said worm (17) and said worm wheel (19) is independent of the direction of rotation of a torque exerted on said worm (17) by said worm wheel (19).
2. The worm gear according to claim 1, characterized in that said shaft (5) is mounted in a housing (11) by means of a fixed bearing (9) and at least one loose bearing (13), and in that said loose bearing or bearings (13) are displaceable in the radial direction (23) in said housing (11).
3. The worm gear according to one of the preceding claims, characterized in that said housing (11) comprises a slot (49) to receive said loose bearing (13) and in that the longitudinal axis of said slot (49) extends in the radial direction (23).
4. The worm gear according to one of the preceding claims, characterized in that said loose bearing (13) bears against said housing (11) via a support ring (47).
5. The worm gear according to one of the preceding claims, characterized in that at least one spring element (25) is provided between said loose bearing (13) and said housing (11) or between said support ring (47) and said housing (11).
6. The worm gear according to claim 5, characterized in that said spring element (25) is a spiral spring or a plate spring.
7. The worm gear according to one of the preceding claims, characterized in that an anti-twist device is disposed between said loose bearing (13) and said housing (11) or between said support ring (47) and said housing (11).
8. The worm gear according to either of claims 1 or 2, characterized in that said loose bearing (13) is connected via a leaf spring to said housing (11), and in that said leaf spring extends perpendicularly to the longitudinal axis of said shaft (5) and perpendicularly to the direction (23) in which said loose bearing (13) is displaceable between said housing (11) and said loose bearing (13).

9. The worm gear according to one of the preceding claims, characterized in that said shaft (5) is the rotor shaft of an electric motor.

10. The worm gear according to one of the preceding claims, characterized in that said worm (17) is cantilevered on said shaft (5).

11. The worm gear according to one of the preceding claims, characterized in that said shaft (5) is mounted in said housing (11) by means of plain bearings (9) and/or rolling bearings (13).

12. A gear assembly for a vehicle steering system comprising a drive shaft (5), which is driven by an electric motor (3), and an output shaft (21), particularly according to one of the preceding claims, characterized in that at least two phases (u, v, w) of said electric motor (3) are short-circuited and said electric motor (3) is disconnected from a voltage supply when said electric motor (3) is not meant to be turning.

13. The worm gear according to one of the preceding claims, characterized in that the short-circuiting of at least two phases (u, v, w) of said electric motor (3) is effected by means of a relay or by means of FET semiconductor elements.

14. The use of a worm gear according to one of the preceding claims, characterized in that said worm gear (1) is used in a servo unit of an electric servo steering system, in a rack-and-pinion steering gear, in a steering actuator, in a speed modulation gear and/or as the steering actuator of a steer-by-wire steering system.